



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/698,948

11/03/2003

Ari Karkkainen

4090-9

5027

23117 7590 12/24/2008
NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER

INGHAM, JOHN C

ART UNIT

PAPER NUMBER

2814

MAIL DATE

DELIVERY MODE

12/24/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/698,948	Applicant(s) KARKKAINEN, ARI	
	Examiner JOHN C. INGHAM	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9,10,12-15,19-29,31-33 and 35-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9,10,14,15,19-29 and 31-33 is/are rejected.
- 7) ☒ Claim(s) 12,13 and 35-37 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 30 September 2008 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims **9, 10, 26-29 and 31-33** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanisawa (US 5,478,778), Gupta and Andrews (US 2004/0037531).

4. Regarding claim **9**, Tanisawa discloses an optical assembly in Fig 5 comprising: first and second optical components (5 and 8), each having an optical confinement region and an optical axis in use, and at least the first optical component having one or more layers (31) defining the optical confinement region; and a shared substrate (1), wherein said first optical component comprises an optoelectronic device which is provided with a bonding surface (5a) and is flip chip mounted on the shared by means

Art Unit: 2814

of said bonding surface and the first and second components are supported by the shared substrate such that their respective optical confinement regions are optically coupled in use (col 4 ln 38), and wherein at least the optoelectronic device has added thereto a dielectric spacing layer (33, silica), additional to the optoelectronic device, which enables electrical contact (23) to be made to the optoelectronic device and determines the distance from the bonding surface to the optical axis (col 5 ln 47) for the first component, when mounted on the shared substrate, to achieve said optical coupling in use.

5. Tanisawa does not specify that the first optical component has a substrate and said spacing layer comprises a glass material having both organic and inorganic components.

6. Gupta teaches that an optical component typically has a substrate so that the component layers may be epitaxially grown before being flip chip mounted (col 3 ln 30). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Gupta on the device of Tanisawa so that the first component layers could be epitaxially grown.

7. Andrews teaches that silica may be replaced with a hybrid glass because the hybrid glasses can have a tailored coefficient of thermal expansion, which results in better performance and stability (§105). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Andrews on the device of Gupta (using the hybrid glass for the spacing layer) for better performance and stability.

8. Regarding claim **10**, Gupta teaches the assembly of claim 9, and that a shared substrate may provide a planar surface on which both said first and second components are flip chip mounted to achieve said optical coupling in use (Fig 5 and Fig 6 shows that either, or obviously both, components may be flipped onto a shared planar substrate 30/62).

9. Regarding claim **26**, Tanisawa discloses the assembly of claim 9 wherein the first component (31) comprises a laser diode.

10. Regarding claim **27**, Gupta teaches the assembly of claim 9, and that laser diodes may comprise semiconductor material selected from one or more of the III-V groups of the periodic table (e.g. GaAs).

11. Regarding claims **28 and 29**, Gupta teaches the assembly of claim 9, wherein the first and second optical components are each able to be flip-chip mounted (Fig 5 and Fig 6 shows that either, or obviously both, components may be flipped onto a shared planar substrate 30/62), so that its optical confinement region lies between its respective substrate and the shared substrate, and wherein the shared substrate comprises a planar surface on which the first and second optical components are flip chip mounted.

12. Regarding claims **31 and 32**, Gupta teaches the assembly of claim 28, wherein the substrate comprised by the first component (GaAs item 30 in Fig 6) has different characteristics and depth from the substrate comprised by the second component (LiTaO item 55 in Fig 5).

13. Regarding claim **33**, Tanisawa discloses the assembly of claim 9 wherein the first component (31) is provided with an electrical connection (21) by means of its bonding surface (5a).

14. Claims **14-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanisawa, Gupta and Andrews as applied to claim 9 above, and further in view of Blauvelt (US 6,987,913). Tanisawa, Gupta and Andrews do not disclose wherein the distance from bonding surface to optical axis for the two components is within 300nm, or 100nm.

15. Blauvelt teaches that the desired objectives of optical junctions are vertical position accuracies of 20nm (col 8 ln 58-59), and teaches a structure of passively aligned photodiodes and waveguides (Fig 20B). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Blauvelt to mount two optical components with optical regions aligned within 20nm of each other, since optical power transfer can be maintained above the 90% level in this arrangement (col 8 ln 60).

16. Claims **19-22, 24, and 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanisawa, Gupta and Andrews as applied to claim 9 above, and further in view of Nashimoto (US 6,816,660). Tanisawa, Gupta and Andrews do not disclose wherein the glass material comprises an inorganic matrix provided in part by a metal alkoxide or salt that has been hydrolyzed.

Art Unit: 2814

17. Nashimoto teaches that glass may be formed by applying metal salts by a sol-gel method and heated (col 11 ln 32-36), producing an extremely smooth thin film with low light loss (col 11 ln 40- 42). Various types of metals and organic compounds are used in metal salts, including those in groups 3A, 3B, etc. of the periodic table. Although the claim language “wherein the glass material is adapted to be processed...” describes a product by process (see MPEP 2113), Nashimoto teaches that the glass material is processed at a temperature ranging from 100° to 500°C. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Nashimoto in order to produce an extremely smooth thin film with low light loss.

18. Claim **23** is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanisawa, Gupta, Andrews and Nashimoto as applied to claim 21 above, and further in view of Kaneko. Tanisawa, Gupta, Andrews and Nashimoto do not specify that the glass material comprises a thermal initiator to polymerize the glass material.

19. Kaneko teaches a method of making an optoelectronic material comprising a thermal initiator (silane chloride) for polymerization (abstract), which has an easily controllable refractive index (col 3 ln 38-39). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Kaneko to make a glass with easily controlled refractive index.

Allowable Subject Matter

20. Claims 12-13 and 35-37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

21. The following is a statement of reasons for the indication of allowable subject matter: the prior art does not disclose or make obvious the device of claim 12, wherein said first and second optical components have bonding surfaces, the distance from the bonding surface to the optical axis for the first component being different from the distance from the bonding surface to the optical axis for the second component, the shared substrate providing a non-planar surface on which both said first and second components are flip chip mounted to achieve said optical coupling in use.

22. the prior art also does not disclose or make obvious the assembly of claim 35, wherein an optical cladding layer of the first component and a support surface for the second component are each provided by areas of the same layer fabricated on the shared substrate.

Response to Arguments

23. Applicant's arguments with respect to claims 9-10, 12-15, 19-29, 31-33 and 35-37 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN C. INGHAM whose telephone number is (571)272-8793. The examiner can normally be reached on M-F, 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Howard Weiss/
Primary Examiner
Art Unit 2814

John C Ingham
Examiner
Art Unit 2814

/J. C. I./
Examiner, Art Unit 2814